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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

HH

Office Action Summary	Application No.	Applicant(s)	
	10/552,505	BROADBENT, ROLAND	
	Examiner	Art Unit	
	Thai-Ba Trieu	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12-15,17-19,21 and 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-15,17-19,21 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 October 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/05/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The Preliminary Amendment filed on October 05, 2005 is acknowledged. Claims 3-9, 14-15, and 17-18 were amended; and claims 11, 16, 20, 22, and 24 were cancelled.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: ***"5"*** and ***"130"*** (See Figure 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the recitation of "fuel being directed into the engine" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Suggestions

1. Claim 12 is suggested to be revised in the method claim format as following:

12. (Original) A method of operating an internal combustion engine comprising the steps of :

[[having]] **providing** a turbocharger **with an impeller and a compressor**,

[[wherein the flow of compressed air from the turbocharger is directed]] **compressing air with the compressor of turbocharger**;

directing a part of the compressed air into the engine and a part to a combustion unit;

injecting fuel [[is directed]] into the engine;

directing exhaust gases from operating the engine [[are directed]] into [[a]] **the** combustion unit in which combustion of combustible products in the exhaust gases is induced, and

[[such combustion generates]] **generating** a flow of gas from **the combustion** [[which is directed]] **and directing the flow of gas** to **the impeller of** turbo charger [[which has an impeller and a compressor, the turbo charger generating a flow of pressurized air of which part is directed to the engine and part to the turbocharger]].

2. Claim 18 should be revise as an independent claim including all limitations of claim 12 and claim 10.

Claim Objections

Claim 10 is objected to because of the following informalities:

- In claim 10, line 8, **-- and** – should be inserted before ***"a gas outlet".***

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 and its dependent claim 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically,

- In claim 12, the recitation of the turbo charger generating a flow of pressurized air of which part is directed to the engine and part to the turbocharger" renders the claim indefinite, since it is not clear that, to which location/component of the turbocharger a part of compressed/pressurized air to be delivered into? Applicant is required to locate or to identify the component of the turbocharger wherein the part of compressed/pressurized air to be delivered into, or to revise the claimed limitation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, 10, 12, 13, 15, 17, 18, 19, 21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Melchior (Patent Number 3,736,752).

Regarding claims 1-2, and 4, Melchior discloses a combustion unit for an internal combustion engine (5), the unit comprising:

a combustion chamber (1) having an inlet (via 10) for admitting exhaust gases from the internal combustion engine (5);

an air inlet (9) for admitting air into the chamber (1), and an outlet (4) in communication with a turbocharger (6) having an impeller (Read as impeller of turbine 6a),

whereby to cause gases from the chamber to drive the impeller (Read as impeller of turbine 6a), operation of the impeller being arranged to drive a compressor (6b, via shaft) for generating a flow of air to the internal combustion engine (5);

the chamber (1) being arranged to cause combustion within the chamber of combustible products in the engine exhaust gas,

wherein the chamber (1) is generally of circular cross section and is arranged to have an exhaust gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (Not Numbered) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 4) from which the gases of combustion are discharged from the chamber outlet to drive the impeller (Read as impeller of turbine 6a) (See Figures 1-2 and 4, Column 2, lines 7-38);

a plurality of peripheral air inlets (via 7) through which air is charged into the chamber at the outer periphery thereof and along the length of the chamber;

wherein the combustion chamber (10) is formed with an outer annular air chamber into which air from the turbo charger (via 9) is introduced and from which the air is arranged to pass into the combustion chamber from a plurality of inlets (via 7) (See Figures 1-2).

Regarding claims 10 and 18/12/10, Melchior discloses an internal combustion engine (5) having:

an air inlet (Not numbered) for introducing compressed combustion air into the engine (5) (See Figure 4),

an exhaust gas outlet (not Numbered) from the engine (5) (see Figure 4),

a compressor (6b) for generating said compressed air flow to the engine (5),

a compressor drive (6a) for driving the compressor (6b), and

a combustion unit (1) providing a flow of gas (via 4) for operating the compressor drive (6a),

the combustion unit (1) having an exhaust gas inlet (via 10) communicating with the exhaust gas outlet (not Numbered) of the engine (5), and

air inlet means (via 9) for admitting air to the unit from the compressor (6b),

whereby the exhaust gas, having combustible material therein, and the air are caused to mix and combust within the unit, and

a gas outlet (via 4) from the unit communicating with the compressor drive (6a) whereby the flow of gases from the gas outlet is arranged to drive the compressor (6b) (See Figure 4).

Regarding claims 12-13, 15, 17 and 18/12, Melchior discloses a method of operating an internal combustion engine having:

a turbocharger (6a, 6b), wherein the flow of compressed air from the turbocharger is directed into the engine (from 6b to 5),

fuel is directed into the engine (fuel being a need for every internal combustion engine),

exhaust gases from operating the engine are directed into a combustion unit (via 10) in which combustion of combustible products in the exhaust gases is induced, and

such combustion generates a flow of gas which is directed to the turbo charger which has an impeller (6a) and a compressor (6b), the turbo charger generating a flow

of pressurized air of which part is directed to the engine (form 6b to 5) and part to the turbocharger (from 6b , 9, 1 and then 6a) (See Figure 4);

wherein the fuel supply to the engine is controlled so that more fuel reaches the engine than is required to run the engine, whereby to increase the combustible material in the exhaust from the engine (See Column 1, lines 3-15);

wherein fuel (via 3) is introduced into the exhaust gases supplied to the combustion chamber to assist combustion in the combustion unit (1) (See Figures 1-2 and 4);

wherein the engine is a diesel engine, a four stroke or a two stroke petrol engine (see Column 2, lines 13)

Regarding claim 19, Melchior discloses a combustion unit (1) comprising:

a combustion chamber (1) having:

an inlet (via 10) for admitting gases containing combustible material,

an air inlet (via 9) for admitting air into the chamber, and

an outlet (4) in communication with a turbocharger having an impeller (6a),

whereby to cause gases from the chamber to drive the impeller (6a), operation of the impeller being arranged to drive a compressor (6b) for generating a flow of air;

the chamber (1) being arranged to cause combustion within the chamber of the combustible material,

wherein the chamber (1) is generally of circular cross section and is arranged to have a gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (1b) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (4) from which the gases of combustion are discharged from the chamber outlet to drive the impeller (6a) (See Figures 1-2 and 4, Column 2, lines 7-38).

Regarding claim 21, Melchior discloses a combustion unit (1) for an internal combustion engine (5), the unit comprising:

a combustion chamber (1) having an inlet (100 for admitting exhaust gases from the internal combustion engine,

an air inlet (9) for admitting air into the chamber, and

an outlet;

the chamber (1) being arranged to cause combustion within the chamber of combustible products in the engine exhaust gas,

wherein the chamber (1) is generally of circular cross section and is arranged to have an exhaust gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (1b) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (4) from which the gases of combustion are discharged from the chamber outlet (See Figures 1-2 and 4, Column 2, lines 7-38).

Regarding claim 23, Melchior discloses a combustion unit comprising:

a combustion chamber (1) having an inlet for admitting gases containing combustible material,

an air inlet (via 9) for admitting air into the chamber, and

an outlet (via 4);

the chamber (1) being arranged to cause combustion of the combustible material within the chamber,

wherein the chamber (1) is generally of circular cross section and is arranged to have a gas inlet (via 10) region which increases in cross-section in the downstream direction and into which air is introduced (via 9),

a central region (1b) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 4) from which the gases of combustion are discharged from the chamber outlet (See Figures 1-2 and 4, Column 2, lines 7-38).

Claims 1-4, 6, 8-10, 12-13, 15, 17-18, 19, 21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Melchior (Patent Number 3,849,988).

Regarding claims 1-4, 6, and 8-9, Melchior discloses a combustion unit (1) for an internal combustion engine (2), the unit comprising:

a combustion chamber (1)having an inlet (7) for admitting exhaust gases from the internal combustion engine;

an air inlet (8) for admitting air into the chamber (1), and an outlet (11) in communication with a turbocharger (4, 5) having an impeller (5),

whereby to cause gases from the chamber (via 11) to drive the impeller (5), operation of the impeller (5) being arranged to drive a compressor (4) for generating a flow of air (Not Numbered, via dashed line to 2) to the internal combustion engine (2);

the chamber (1) being arranged to cause combustion within the chamber of combustible products in the engine exhaust gas (via 7),

wherein the chamber (1) is generally of circular cross section and is arranged to have an exhaust gas inlet region (15) which increases in cross-section in the downstream direction and into which air is introduced (via 25),

a central region (including 9 and 21) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet (via 11) to drive the impeller (5) (See Figure , Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30);

a plurality of peripheral air inlets (25) through which air is charged into the chamber (1) at the outer periphery thereof and along the length of the chamber;

wherein the chamber reduces in cross-section over the outlet region (via 11) (See Figure);

wherein the combustion chamber (1) is formed with an outer annular air chamber (not Numbered) into which air from the turbo charger (via compressor 4) is introduced and from which the air is arranged to pass into the combustion chamber from a plurality of inlets (See Figure);

wherein the flow of air (via 25, 20) into the central region is arranged to assist the gases passing along the chamber to enter the annular region (within 9) , the air inlets being directed generally tangentially to the walls of the chamber (1) (See Figure);

wherein at the central region (including 9 and 21) is provided a tubular member around which is arranged the annular region, the internal dimension of the tubular member diminishing in the downstream direction and the member defining a passage out of which air is directed into the annular region, the tubular member defining means for inducing a flow of gases into the annular region (See Figure);

wherein the chamber cross-section diminishes towards the outlet (via 11) and air is introduced into the outlet region (via 17) to complete the combustion process (See Figure, Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30).

Regarding claims 10 and 18/10, Melchior discloses an internal combustion engine having:

an air inlet (via dashed line from 4 to 2) for introducing compressed combustion air into the engine,

an exhaust gas outlet from the engine Via dashed line form 2 to 7),

a compressor (4) for generating said compressed air flow to the engine,

a compressor drive (5) for driving the compressor, and

a combustion unit (1) providing a flow of gas for operating the compressor drive,

the combustion unit (1) having an exhaust gas inlet (7) communicating with the exhaust gas outlet of the engine, and

air inlet means (8) for admitting air to the unit from the compressor (4),

whereby the exhaust gas, having combustible material therein, and the air are caused to mix and combust within the unit 91 at 16), and

a gas outlet (via 11) from the unit communicating with the compressor drive (5) whereby the flow of gases from the gas outlet is arranged to drive the compressor (4) (See Figure , Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30).

Regarding claims 12-13, 15, 17, 18/10/12, Melchior discloses a method of operating an internal combustion engine (2) having:

a turbocharger (4, 5), wherein the flow of compressed air from the turbocharger is directed into the engine (via dashed line form 4 to 2),

fuel is directed into the engine (inherently every engine should have fuel injectors to inject fuel into engine),

exhaust gases (via dashed line form 2 to 7) from operating the engine are directed into a combustion unit (1) in which combustion of combustible products in the exhaust gases is induced, and

such combustion generates a flow of gas which is directed to the turbo charger which has an impeller (5) and a compressor (4), the turbo charger (4, 5) generating a flow of pressurized air of which part is directed to the engine (via dashed line from 4 to 2) and part to the turbocharger, wherein the fuel supply to the engine is controlled so that more fuel reaches the engine than is required to run the engine, whereby to increase the combustible material in the exhaust from the engine (See Figure, Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30);

wherein fuel is introduced into the exhaust gases supplied to the combustion chamber to assist combustion in the combustion unit (via 6) (See Figure);

wherein the engine is a diesel engine, a four stroke or a two stroke petrol engine (See Abstract).

Regarding claim 19, Melchior discloses a combustion unit (1) comprising a combustion chamber having:

an inlet (via 7) for admitting gases containing combustible material,

an air inlet (via 8) for admitting air into the chamber, and

an outlet (via 11) in communication with a turbocharger having an impeller (5),

whereby to cause gases from the chamber to drive the impeller (5), operation of the impeller being arranged to drive a compressor (4) for generating a flow of air;

the chamber (1) being arranged to cause combustion within the chamber of the combustible material,

wherein the chamber is generally of circular cross section and is arranged to have a gas inlet region (via 7) which increases in cross-section in the downstream direction and into which air is introduced (via 24),

a central region (9, 19, 21) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet to drive the impeller (5) (See Figure, Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30).

Regarding claim 21, Melchior discloses a combustion unit (1) for an internal combustion engine (2), the unit comprising:

a combustion chamber (1) having:

an inlet (via 7) for admitting exhaust gases from the internal combustion engine,

an air inlet (8) for admitting air into the chamber, and

an outlet (via 11);

the chamber (1) being arranged to cause combustion within the chamber of combustible products in the engine exhaust gas,

wherein the chamber (1) is generally of circular cross section and is arranged to have an exhaust gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (9, 19, 21) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet (See Figure, Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30).

Regarding claim 23, Melchior discloses a combustion unit (1) comprising:

a combustion chamber (1) having:

an inlet (via 7) for admitting gases containing combustible material,

an air inlet (8) for admitting air into the chamber, and

an outlet (via 11);

the chamber (1) being arranged to cause combustion of the combustible material within the chamber,

wherein the chamber (1) is generally of circular cross section and is arranged to have a gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (9, 19, 21) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet (See Figure, Column 2, lines 63-68, Column 3, lines 1-68, and Column 4, lines 1-30).

Claims 1-2, 4-5, 7, 12-13, 15, 17, 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Melchior (Patent Number 4,004,414).

Regarding claims 1-2, 4-5, and 7, Melchior discloses a combustion unit for an internal combustion engine (1), the unit comprising:

a combustion chamber (5) having an inlet (via 33) for admitting exhaust gases from the internal combustion engine (1),

an air inlet (via 6) for admitting air into the chamber (5), and

an outlet (11) in communication with a turbocharger having an impeller (3),

whereby to cause gases from the chamber to drive the impeller (3), operation of the impeller (3) being arranged to drive a compressor (2) for generating a flow of air to the internal combustion engine (form 2 , 4 to 1);

the chamber (5) being arranged to cause combustion within the chamber of combustible products in the engine exhaust gas, wherein the chamber is generally of circular cross section and is arranged to have an exhaust gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (9) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet to drive the impeller (3) (See Figures 1 and 5-6, Column 5, lines 19-56);

a plurality of peripheral air inlets (11a) through which air is charged into the chamber at the outer periphery thereof and along the length of the chamber;

wherein the combustion chamber (5) is formed with an outer annular air chamber into which air from the turbo charger (2, 3) is introduced and from which the air is arranged to pass into the combustion chamber from a plurality of inlets (11a);

wherein there is provided over the central region (9), an annular region (Within 9), and means for inducing a flow of gases (11b) outwardly in an annular flow, into said annular region; and

wherein air is introduced into the chamber at the radially inner sides of the annular region in the outwards direction (See Figure 1).

Regarding claims 10 and 18/10, Melchior discloses a combustion engine (1) having:

an air inlet (via 6) for introducing compressed combustion air into the engine,

an exhaust gas outlet (via 33) (2) for generating said compressed air flow to the engine,

a compressor drive (3) for driving the compressor (2), and

a combustion unit (5) providing a flow of gas for operating the compressor drive (3) (via 11),

the combustion unit (5) having an exhaust gas inlet communicating with the exhaust gas outlet of the engine (via 33), and

air inlet means (via 6) for admitting air to the unit from the compressor (2), whereby the exhaust gas, having combustible material therein, and the air are caused to mix and combust within the unit (at 11b), a gas outlet (via 11) from the unit communicating with the compressor drive (3) whereby the flow of gases from the gas

outlet is arranged to drive the compressor (2) (See Figures 1 and 5-6, and Column 5, lines 19-56).

Regarding claims 12-13, 15, 17 and 18/12/10, Melchior discloses a method of operating an internal combustion engine (1) having a turbocharger (1, 3), wherein the flow of compressed air from the turbocharger (via compressor 2) is directed into the engine (1), fuel is directed into the engine (inherently for every engine), exhaust gases from operating the engine are directed into a combustion unit (via 33) in which combustion of combustible products in the exhaust gases is induced, and such combustion generates a flow of gas which is directed to the turbo charger (2, 3) which has an impeller (3) and a compressor (2), the turbo charger generating a flow of pressurized air of which part is directed to the engine (from 2 to 1) and part to the turbocharger (See Figures 1 and 5-6, and Column 5, lines 19-56);

wherein the fuel supply to the engine is controlled so that more fuel reaches the engine than is required to run the engine, whereby to increase the combustible material in the exhaust from the engine;

wherein fuel is introduced into the exhaust gases supplied to the combustion chamber to assist combustion in the combustion unit (via 24);

wherein the engine is a diesel engine, a four stroke or a two stroke petrol engine (See Abstract).

Regarding claim 19, Melchior discloses combustion unit comprising a combustion chamber having:

an inlet (via 33) for admitting gases containing combustible material,

an air inlet (via 6) for admitting air into the chamber, and

an outlet (via 11) in communication with a turbocharger (2, 3) having an impeller (3),

whereby to cause gases from the chamber to drive the impeller (3), operation of the impeller (3) being arranged to drive a compressor (2) for generating a flow of air;

the chamber being arranged to cause combustion within the chamber of the combustible material,

wherein the chamber (5) is generally of circular cross section and is arranged to have a gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (within 5) downstream of the inlet region flow is induced, and an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet to drive the impeller (3) (See Figures 1 and 5-6, and Column 5, lines 19-56).

Regarding claim 21, Melchior discloses a combustion unit for an internal combustion engine (1), the unit comprising:

a combustion chamber (5) having:

an inlet for admitting exhaust gases (via 33) from the internal combustion engine,

an air inlet (via 6) for admitting air into the chamber, and

an outlet (via 11);

the chamber (5) being arranged to cause combustion within the chamber of combustible products in the engine exhaust gas,

wherein the chamber (5) is generally of circular cross section and is arranged to have an exhaust gas inlet region which increases in cross-section in the downstream direction and into which air is introduced (11a),

a central region (within 5) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (via 11) from which the gases of combustion are discharged from the chamber outlet (See Figures 1 and 5-6, and Column 5, lines 19-56).

Regarding claim 23, Melchior discloses combustion unit comprising a combustion chamber (5) having:

an inlet (via 33) for admitting gases containing combustible material,

an air inlet (via 6) for admitting air into the chamber, and

an outlet (via 11);

the chamber (5) being arranged to cause combustion of the combustible material within the chamber,

wherein the chamber is generally of circular cross section and is arranged to have a gas inlet region which increases in cross-section in the downstream direction and into which air is introduced,

a central region (within 5) downstream of the inlet region in which an annular air flow is induced, and

an outlet region (11) from which the gases of combustion are discharged from the chamber outlet (See Figures 1 and 5-6, and Column 5, lines 19-56).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Melchior (Patent Number 3,736,752 or Patent Number 3,849,988), in view of Ennarino et al. (Patent Number 3,285,709).

Melchior discloses the invention as recited above, and further discloses the central region (9), an annular region (within 9); however Melchior fails to disclose means for inducing a flow of gases outwardly in an annular flow.

Ennarino teaches that it is conventional in the art of apparatus for the treatment of exhaust gas, to utilize means for inducing a flow of gases outwardly in an annular flow (106) (See Figure 3, Column 6, lines 32-36).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized means for inducing a flow of gases outwardly in an annular flow, as taught by Ennarino, to guide/introduce a flow of gases to the desired location in the Melchior device.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Melchior (Patent Number 3,736,752 or Patent Number 3,849,988 or Patent Number 4,004,414)

Melchior discloses the invention as recited above; however, Melchior fails to disclose fuel being supplied to the engine up to 8%.

One having an ordinary skill in the art of *turbocharged internal combustion engine* having a combustor/combuster/or auxiliary combustion unit, would have found

fuel being supplied to the engine up to 8%, as a matter of design choice *depending on the engine requirements*. Moreover, there is nothing in the record which establishes that *the claimed percentage of fuel to be supplied into the engine*, presents a novel of unexpected result (See In re Kuhle, 526 F. 2d 553, 188 USPQ 7 (CCPA 1975)).

Conclusion

The IDS (PTO-1449) filed on June 23, 2006 has been considered. An initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Melchior et al. (US Patent Number 5,018,354) disclose auxiliary combustion chambers for a supercharged internal combustion engine.

- Kobayashi et al. (US Patent Number 4,517,802) disclose a turbocharger combustor method.

- Kobayashi et al. (US Patent Number) disclose a turbocharger combustor system.

- Daeschner (US Patent Number 4,215,549) discloses a turbocharger combustor system.

- Holste (US Patent Number 4,185,859) discloses a turbo exhaust cleaner.

- McCrocklin (US Patent Number 3,603,080) discloses an emission control assembly.

- McCrocklin (US Patent Number 3,603,081) discloses an emission control means.

- Eannarino et al. (US Patent Number 3,435,613) disclose an apparatus for the treatment of exhaust gas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TTB
November 18, 2007

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